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Florida Bridge Pilot

FINAL REPORT TO THE NATIONAL SERVICE OFFICE FOR NURSE-FAMILY PARTNERSHIP AND CHILD FIRST

Florida Bridge Pilot Final Report | February 2024
PREVENTION RESEARCH CENTER FOR FAMILY & CHILD HEALTH
UNIVERSITY OF COLORADO SCHOOL OF MEDICINE

Contents

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EXECUTIVE SUMMARY

Summary of Study

The Florida Bridge Pilot began in 2020 and focused on understanding the effect of expanding Nurse-Family Partnership (NFP) to those referred after 28 weeks of pregnancy because this was a gap in our previous research, which focused on expansion of NFP to individuals with previous live births or 'multips'.[1] We were particularly interested in learning if expansion of NFP to allow late registrants would enable NFP to better serve the community by reaching the population of families with overlapping risks for poor health and life course outcomes who are known to benefit most from participating in NFP. The objectives of our study were to:

1. Describe the characteristics of pregnant people referred to NFP after 28 weeks gestation,
2. Describe reasons for 'late' referral, [2]
3. Describe rates of enrollment in NFP,
4. Describe reasons for not enrolling in NFP,
5. Determine how pregnant people enrolled in NFP but who were referred to NFP after 28 weeks gestation may differ from those enrolled 'on time', [3] and
6. Explore the use of existing data sources for future studies of NFP's impact on pregnancy, maternal health, and child health and development in Florida.

We used a variety of data sources to conduct our study including Florida's Prenatal Risk Screen, Coordinated Intake and Referral System, and Birth Certificates. We also used data from NFP program implementation and interviews of NFP supervisors and nurses, clients, and referral partners. Our findings are grouped into 3 major categories: Referrals to NFP, Enrollment in NFP, and Group Differences among those enrolled in NFP. We examined referrals to NFP to help us determine if *allowing* late referrals *increased* referrals of those most likely to benefit from NFP, i.e., people with overlapping adversities. This analysis is novel because it cannot be done using data collected by NFP alone and relies on data sources outside of routine NFP data collection. We examined enrollment in NFP to determine if pregnant individuals referred late had different enrollment rates than those referred on time. Finally, we examined differences between two groups of NFP clients—those who had been referred to NFP on time and those who had been referred to NFP late—to help us understand how 'late registrants'[4] may differ from 'on time' NFP clients,[5] how nurses adapted NFP to serve late registrants, and whether program implementation and program outcomes differed for late registrants compared to 'on time' NFP clients.

Key Findings

Referrals to NFP[6]

- Pregnant individuals referred to NFP after 28 weeks gestation were <u>less likely to have been born in the United States</u> and <u>more likely to have been pregnant previously and to have other children in the home under age 5 years</u> compared to those referred to NFP by 28 weeks gestation. Those referred after 28 weeks were not different for other demographic characteristics.
- Those referred after 28 weeks were <u>more likely to have their first prenatal visit in the 2nd or 3rd trimesters</u> compared to those referred by 28 weeks. While our findings suggest that about half of those referred late were not identified in a timely manner due to late prenatal care, about half received prenatal care in the 1st trimester and could have been identified and referred to NFP sooner.
- Those referred after 28 weeks were not different for pregnancy preferences compared to those referred by 28 weeks. As more late referrals are made to NFP, further analyses may be indicated to explore whether those referred after 34 weeks are more likely to report not wanting to be pregnant.

[1] 'Multip' or 'multips' refers to multiparous people, who are people having experienced one or more live births.
[2] 'Late referral' refers to the process of being referred to services for NFP after 28 weeks of pregnancy.
[3] 'On time' refers to the process of referrals to services from NFP prior to or by 28 weeks of pregnancy and subsequent enrollment before 28 weeks of pregnancy.
[4] 'Late registrants' refer to people who enrolled in NFP after 28 weeks of pregnancy.
[5] 'On time' NFP clients refers to clients to enrolled in NFP before or by 28 weeks of pregnancy.
[6] Referral refers to the process of a referral being submitted to services for NFP. These findings include pregnant individuals who were referred but did <u>not</u> ultimately enroll in NFP and those who were referred and did ultimately enroll in NFP.

- Those referred after 28 weeks were not different for physical and mental health indicators compared to those referred by 28 weeks *except* they were more likely to report smoking prior to becoming pregnant. As more late referrals are made to NFP, further analyses may be indicated to explore whether those referred after 34 weeks are more likely to report being hurt or threatened in the past year.
- Qualitative learnings suggest that clients referred after 28 weeks are ethnically and racially diverse; NFP staff state that late registrants include those who are immigrants and/or have undocumented status.
- Qualitative interviews revealed issues with the Coordinated Intake and Referral process including lag times from completion of screening to receipt of the referral by NFP.
- Health care provider practices, including delayed prenatal screening or not informing clients about program options until later in pregnancy are additional reasons for referrals to NFP after 28 weeks.
- Person-level reasons for referral to NFP after 28 weeks are related to not receiving on-time prenatal appointments due to health system practices or rescheduling issues.
- Receipt of prenatal care later in pregnancy delays the referral process, with reasons for delaying prenatal care including denial of pregnancy, not realizing they are pregnant, waiting for receipt of Medicaid or delaying receipt of Medicaid to optimize usage, immigrant or undocumented status, lack of knowledge about where or when to access prenatal care, distrust of the health system, and barriers due to transportation or employment.

Enrollment in NFP[7]

- Based on early findings, pregnant people referred to NFP after 28 weeks are more likely to enroll in the program compared to those referred on time; however, on-going analysis is needed to confirm this finding.
- Qualitative learnings suggest that some pregnant individuals may initially refuse NFP and later decide to enroll.
- Clients who transfer due to relocation to a different NFP team after 28 weeks of pregnancy are labeled as late registrants, even though they enrolled prior to 28 weeks before their transfer.
- Clients may relocate to a different area to obtain social and community support and wait until they are settled prior to accessing services.
- NFP nurse caseloads and waitlists may delay enrollment.
- Multip clients may delay enrollment because they have prior experience with pregnancy and/or are not experiencing any pregnancy concerns.

Group Differences

Characteristics of late registrants compared to NFP clients referred on time.

- Among NFP clients, late registrants were more likely to speak Spanish compared to those referred on time.
- Among NFP clients, late registrants were less likely to report having used marijuana in the past 2 weeks around the time of NFP intake compared to those referred on time. We have some evidence that late registrants may be more likely to be missing substance use data, so this finding is limited by that concern. NFP clients did not differ for other health indicators measured near the time of NFP intake by timing of referral to NFP.
- Qualitative results indicated that nurses serve late registrant clients whose native language is not English and need Spanish-speaking nurses on their teams to meet the needs of their client population.
- Much like clients who enroll before 28 weeks of pregnancy, late registrants experience adversities including food and housing insecurity, mental health and substance use concerns, and physical health concerns. Nurse home visitors prioritize addressing these concerns prior to delivery.

NFP program delivery

- Late registrants had fewer visits during pregnancy compared to those referred on time. However, NFP nurses 'made up' those visits, because by 12 months postpartum, there was not a difference in the number of visits between those referred on time and late registrants. The average visit length was not different between NFP clients referred on time and late registrants.

[7] Enrollment occurs after a client is referred, is determined to be eligible to receive services from NFP, and consents to participate in NFP.

- Late registrants had better retention and similar or better rates of screening for mental health and child development concerns compared to NFP clients referred on time.
- NFP nurses were more likely to make referrals for late registrants for substance use and for enrollment to Medicaid for the child. In the subgroup of NFP clients referred after 34 weeks gestation, nurses were more likely to make referrals for interpersonal violence compared to NFP clients who had been referred on time.
- Nurses adjusted the frequency of visits during the final weeks of pregnancy before delivery to keep late registrants engaged in the program, including meeting more frequently, having longer visits, and utilizing phone calls and text messaging between visits.
- Nurses stated that they modified the educational content covered to meet the needs of late registrants including moving quickly through the various education topics and trying to cover a lot of material during the short window before delivery.

NFP program outcomes

- NFP clients referred on time and late registrants did not have differences in NFP program outcomes.[8] However, small numbers of late registrants limit our analysis, and differences in NFP program outcomes should be reevaluated as more late registrants have the opportunity to complete the NFP program.

Implications and Recommendations

In collaboration with an Advisory Board convened for this study, we propose the following implications and recommendations based on our findings:

- Allowing enrollment of pregnant individuals referred to NFP after 28 weeks gestation but prior to the birth of the child increases the reach of NFP in the community and increases access to NFP for immigrants, people who do not speak English, people with other children (multiparous people or 'multips'), people who use tobacco, and those who receive prenatal care after the first trimester.
- More work is needed to improve systems to identify pregnant people who would benefit from services earlier in pregnancy and ensure they are offered those services including access to prenatal care.
- While numbers of late registrants are small and outcomes should continue to be monitored, NFP program outcomes[8] appear to be similar for late registrants and clients enrolled on time.
- Given that allowing enrollment of late referrals increase NFP's reach and outcomes[8] do not appear to differ for late registrants and clients enrolled on time, NSO should consider continuing to allow enrollment of pregnant individuals referred after 28 weeks gestation but before the birth of the baby.
- Future research should include measuring the impact of NFP for late registrants compared to people with similar characteristics who do not receive NFP. In addition, the question of 'how late is too late' should be investigated. For example, we expect that NFP would not impact birth outcomes for people who enroll a short time prior to giving birth or after giving birth, but NFP may still affect later outcomes such as caregiver-child interactions and child development in this population.

[8] Program outcomes refer to 1) low birth weight, 2) preterm delivery, 3) initiated breastfeeding, 4) clients over 18 working at 12 months postpartum, 5) clients increased education at 12 months postpartum, 6) positive mental health screen and referred to services, 7) child admitted to emergency department for injury, 8) child hospitalized for injury, 9) child admitted to emergency department for ingestion, and 10) child hospitalized for ingestion.

PURPOSE AND STUDY OBJECTIVES

NFPx, or the expanded eligibility initiative, is a change to two of the Nurse Family Partnership (NFP) model elements through the expansion of eligibility for NFP to individuals with previous live births (multiparous people or 'multips') and those who are referred to NFP after 28 weeks gestation but before the birth of the child (late registrants). NFP Network Partners in Florida were given the opportunity to participate in NFPx in 2020 in response to the availability of Child Abuse Prevention and Treatment Act (CAPTA) funding for NFP Network Partners to expand service to families identified as elevated risk for child abuse. The team at the Prevention Research Center for Family and Child Health (PRC) initially collaborated with partners at the National Service Office for NFP and Child First (NSO) and the Florida Department of Child Welfare (DCF) to develop a plan to study the implementation of NFPx in Florida. The team called this study 'The Florida Bridge Pilot' because the results would serve as a bridge, or intermediary, between a formal research study such as randomized clinical trial (RCT) and national implementation of NFPx. The team chose to focus the Florida Bridge Pilot on understanding the effect of expanding NFP to those referred after 28 weeks of pregnancy because this was a gap in our previous research which focused on expansion of NFP to individuals with previous live births or multips. We were particularly interested in learning if expansion of NFP to allow late registrants would enable NFP to better serve the population of families with overlapping risks for poor health and life course outcomes who are known to benefit most from participating in NFP. The objectives of our study were to:

1. Describe the characteristics of pregnant people referred to NFP after 28 weeks' gestation,
2. Describe reasons for 'late' referral,
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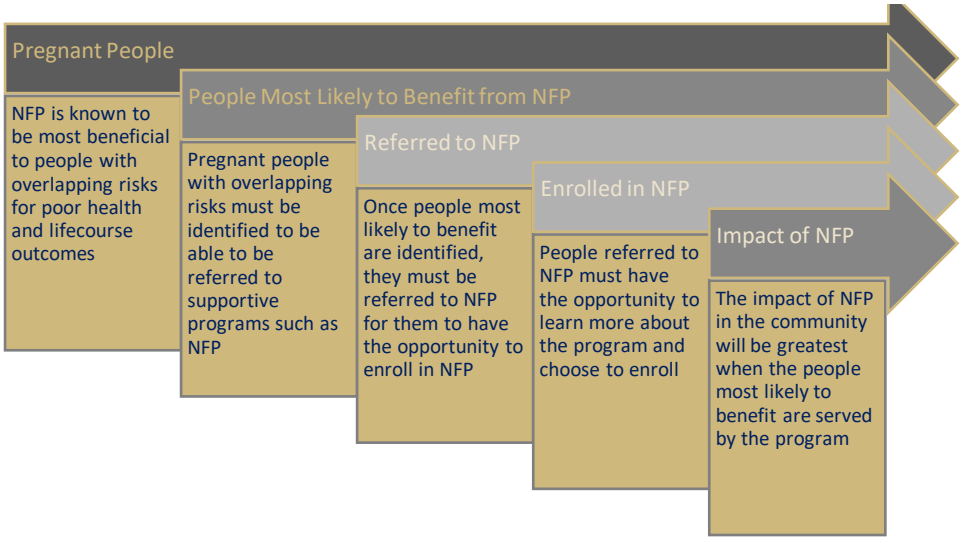
4. Describe reasons for not enrolling in NFP,
5. Determine how pregnant people enrolled in NFP after 28 weeks' gestation may differ from those enrolled 'on time', and
6. Explore the use of existing data sources for future studies of NFP's impact on pregnancy, maternal health, and child health and development in Florida.

While we are interested in determining if participation in NFP improves pregnancy, maternal health, and child health outcomes for late registrants and multips (i.e., impact), the impact of NFP is influenced by processes that precede program delivery as depicted below (see Figure 1). Therefore, we focused this study on determining if allowing enrollment of pregnant individuals referred to NFP after 28 weeks supported the identification of pregnant individuals most likely to benefit from NFP, referral of those people to NFP, and enrollment of those people in NFP.

FIGURE 1: PROCESSES FLOW RESULTING IN NFP IMPACT



METHODS

We conducted a mixed-methods study to answer our research questions. Mixed-methods studies use a combination of quantitative data, which is numbers-based, and qualitative data, which is information that cannot be represented by numbers and frequently uses interviews or text.

QUANTITATIVE METHODS

Data Sources

Table 1 shows the sources of quantitative data and their purpose in our study. Florida Prenatal Risk Screen: Florida State Statute requires health care providers delivering prenatal services to offer and explain a prenatal risk screening instrument at every pregnant person's initial visit. Copies of the risk screening forms are available here: https://www.healthystartflorida.com/forms-brochures/forms/. Coordinated Intake and Referral Data: Completed risk forms are shared with the Coordinated Intake and Referral system also known as CONNECT. CONNECT is overseen by the Healthy Start Coalitions in Florida but is distinct from the Healthy Start program. Referral specialists at CONNECT review the risk forms, contact pregnant people, and offer a variety of services from which they may benefit based on review of their forms. These services include NFP and other home-visiting programs. Data from Healthy Start includes the prenatal risk screen responses, contacts made to pregnant people with positive risk screens, and programs to which individuals are referred. Birth Certificates: In the United States, state and federal laws require birth certificates to be completed for all births using a standard form. A copy of the standard form for live births is available here: https://www.cdc.gov/nchs/data/dvs/birth11-03final-ACC.pdf. Data from NFP Program Implementation: Local Network Partners implementing NFP collect data to guide their clinical practice, conduct continuous quality improvement activities, and monitor program outcomes. Each Network Partner shares their data with the National Service Office.

TABLE 1. DATA SOURCES

Data Source	Agency	Purpose
Florida Prenatal Risk Screen	Florida Department of Health and Healthy Start Mom Care Network	• Characteristics of people referred after 28 weeks of pregnancy (late) • Characteristics of pregnant people referred late who do not enroll in NFP
Coordinated Intake and Referral Data	Healthy Start Mom Care Network	• Identification of people referred to NFP • Rates of enrollment in NFP
Birth Certificates	Florida Department of Health	• Characteristics of people referred after 28 weeks of pregnancy (late) • Characteristics of pregnant people referred late who do not enroll in NFP • How NFP clients enrolled late differ from those enrolled 'on time'
Data from NFP Program Implementation	National Service Office for NFP and Child First	• Identification of people referred to NFP • Rates of enrollment in NFP • Reasons for not enrolling • How those enrolled on time differ from those enrolled late in terms of characteristics, engagement, and retention in NFP

Data Analysis

Data Matching: Birthing person's name, date of birth, expected and actual delivery date and other identifiers were used to match all known NFP referrals as identified by either the NSO data system or the Florida Coordinated Intake and Referral system to the Prenatal Risk Screen and Birth Certificate data. Both exact and "fuzzy matching" were used to maximize the amount of data included in this report. Fuzzy matching refers to a technique used when there is not an exact data match but at least two elements are similar enough to approximate that they are the same individual (e.g., often used when names are misspelled). Figures 2 and 3 depict the matching process and proportion of referrals matched to each data source.

FIGURE 2: DATA SOURCES AND MATCHING PROCESS

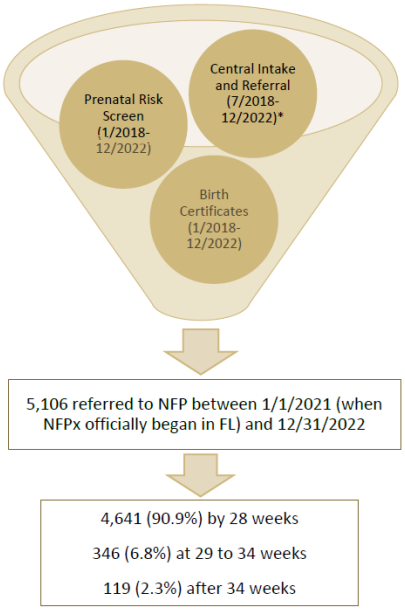
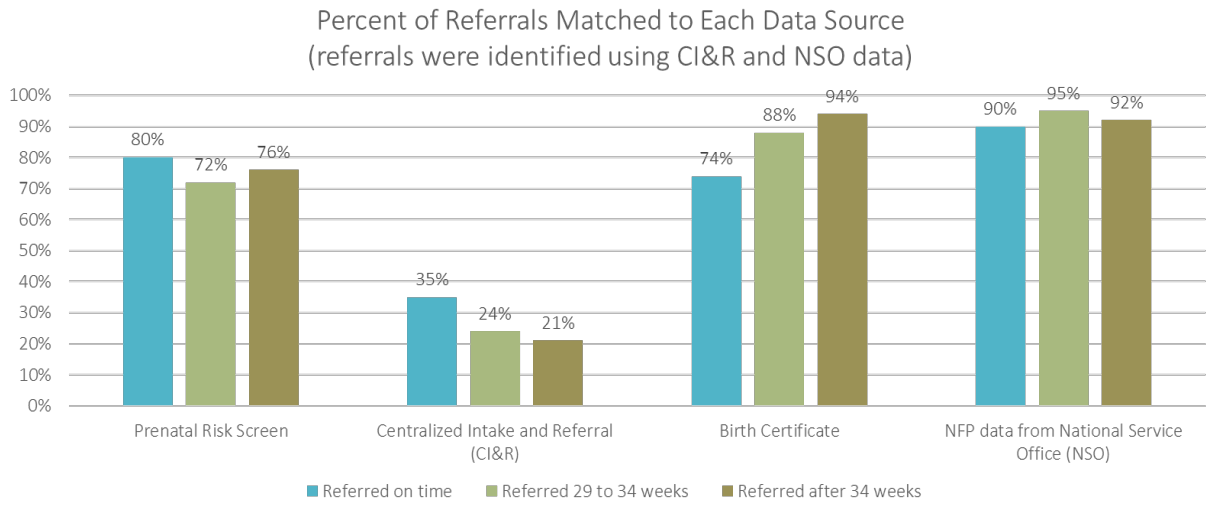


FIGURE 3: PERCENT OF REFERRALS MATCHED TO EACH DATA SOURCE[9]



Analyses

We used descriptive statistics to summarize the data. Chi-square tests and t-tests were used to make comparisons between groups. To increase sample size, for some analyses we combined together all groups referred after 28 weeks. Analyses were conducted in SAS (quantitative statistical software).

[9] CI&R data was not available to match to referrals made in 2022 at the time of this writing and is not reflected in the graph. We anticipate more than 50% match once we receive CI&R data for 2022.

QUALITATIVE METHODS

As part of a mixed-methods approach, our goal in performing qualitative interviews was to determine how women referred and enrolled in NFP after 28 weeks of pregnancy may differ from women referred and enrolled prior to 28 weeks of pregnancy, the process of referring and enrolling, and how these may contribute to late enrollment. Using a grounded theory approach, we interviewed NFP nurses, NFP supervisors, other organizational partners from Florida NFP Network Partners to understand their perspectives and experiences in referring women to NFP 'late,' enrolling women who are referred 'late,' and engaging women who enroll 'late' in NFP. We also interviewed NFP clients who enrolled after 28 weeks of pregnancy.

Population: NFP nurse home visitors nurse supervisors, and NFP clients (graduated or current) from three Florida NFP Network Partners who are currently enrolling women into NFP after 28 weeks were invited to participate. We also interviewed organizational partners, i.e., referral partners, who were knowledgeable about referring and serving women who enroll in NFP after 28 weeks of pregnancy.

Sampling: We purposefully sampled study participants from three Florida NFP Network Partner serving the largest proportion of late registrants in January 2022. Within each NFP Network Partner (site), we collaborated with nurse supervisors to identify and recruit potential participants with an emphasis on nurse home visitors serving women who enroll late and other NFP staff familiar with the process of serving these women. We then used snowball sampling to recruit other organizational partners who refer and/or serve women enrolling late. NFP nursing staff recommended former and current NFP clients who enrolled after 28 weeks of pregnancy for participation in interviews and obtained permission from clients to share their contact information with researchers.

Outreach: Outreach occurred first with NFP nurse supervisors and then identified NFP nurse home visitors and other NFP staff currently engaged in late enrollment. Initial contact by researchers with NFP nurse home visitors and supervisors were conducted via email. Follow-up communication occurred to coordinate interview scheduling.

Interview process: Interviews were conducted by phone or Zoom conferencing and lasted 30 to 60 minutes. Our interview strategy used open-ended questioning directed by a thematic interview guide designed to focus on exploring perspectives and experiences in enrolling and engaging women who enroll in NFP after 28 weeks of pregnancy. With the permission of the respondents, we audio recorded all interviews for analysis purposes. A Spanish-speaking research assistant conducted interviews with Spanish-speaking clients.

Data Analysis: We used an iterative and thematic approach to identify and document the key themes in each interview. Recorded interviews were professionally transcribed by an external contractor, then validated, and formally coded by the research team. Spanish interviews were translated to English and validated by the Spanish-speaking research assistance for validity. Coding consistency was assessed and maintained through coding comparison statistics with Kappa statistics of 0.60 or greater being our threshold for consistent coding between multiple coders. Coded data was organized by theme through coding queries and results were synthesized through memo writing. Research memos were shared with the Advisory Board for validation. Information was synthesized across the three Florida Network Partners to summarize the similarities and differences in serving late enrolled women compared to women enrolled prior to 28 weeks of pregnancy. Our analysis was conducted in NVivo12 (qualitative research software).

Qualitative Results

Interviews. The study team conducted 30 qualitative interviews including NFP staff (nurse home visitors and team supervisors), community partners, and NFP clients (see Table 2 for details). Community partners included coordinated intake supervisors and directors and other community program professionals. Site 1 consisted of two teams, each with their own supervisor. All sites were implemented by community-based organizations or non-profits. Interviews were conducted between January 14, 2022, and April 19, 2022.

TABLE 2: DISTRIBUTION OF QUALITATIVE INTERVIEWS BY SITE

	Agency Type	# of Teams	NFP Staff (n)	Community Partners (n)	NFP Clients (n)	Total, n (%)
			Count	*Count*	*Count*	
Site 1	CBO*	2	6	3	2	**11 (37%)**
Site 2	CBO*	1	4	1	1	**6 (20%)**
Site 3	CBO*	1	8	1	3	**12 (40%)**
other**	CBO*			1		**1 (3%)**
Total Interviews, n (%)			**18 (60%)**	**6 (20%)**	**6 (20%)**	**30 (100%)**

**Community-Based Organization*

***non-site affiliated*

Implementation and Organizational Structure. All teams are primarily implemented through community based non-profit organizations (see Table 3). For **Site 1,** the two NFP teams are based out of the same agency, a non-profit entity which began about 20 years ago as the local Healthy Start Coalition with ties to the local state university to address infant mortality disparities. The non-profit agency employs over 50 staff and houses over 10 programs, ranging from a doula program, three male involvement programs, kinship care, community outreach, stress management, Healthy Start, NFP, and Pregnancy Medical Homes. NFP is the only evidence-based program at the agency, which means funding is more secure for NFP than other programs. In **Site 2,** the team is spread out as four separate entities (as NFP subcontracts). The nurse supervisor and two nurses are based out of a local hospital system, while the remaining three nurses are based out of their own Department of Health in three different counties. The hospital system has six hospitals (four acute care and two specialty care) and is the largest employer in the region; the nurse supervisor and one nurse home visitor are based out of one of the acute care hospitals. In **Site 3,** there is one organization, a network of health centers, that holds the NFP contract and hires the nurse supervisor and data entry/program coordinator. Then, there are subcontracts with three federally qualified health centers (FQHC) and one faith-based nonprofit agency that employ the NFP nurses. The FQHCs were described as a one stop shop for lower income, underserved, underinsured or Medicaid-insured populations. They offer health care for pregnant and postpartum people, in pediatrics, internal medicine, mental health, dental care, and imaging/diagnostics, and community programs for primary prevention.

Team Structures. In **Site 1**, **Team 1** is funded to hire eight nurses; there is one bilingual Spanish-speaking nurse, and three nurses are serving five late registrant clients. The nurse supervisor reports to her direct supervisor (a clinical director currently vacant, so she reports to the agency's CEO) and the director of programming at the local Healthy Start Coalition. **Team 2** is funded to hire four nurses. The nurse supervisor for this team was previously a nurse home visitor from Team 1. There is also one bilingual Spanish-speaking nurse, and three nurses are serving at least four late registrant clients. All NFP nurses on Teams 1 and 2 can serve late registrants and multips, except for the new nurse from Team 2 who is still going through training. Team 1 is funded through MIECHV only, while Team 2 was expanded and is funded through CAPTA funding. For these reasons, Team 2 tends to serve "higher risk" clients experiencing adversities. The CAPTA funding further requires that NFP nurses work with a neonatologist through Plans of Safe Care to support these clients. Plans of Safe Care is a component of CAPTA that requires various entities including delivery hospital and public health agencies to collaborate, develop, implement, and monitor recovery and care plans for infants and families affected by substance use during pregnancy. Because Team 2 is an expansion team and must work with Plans of Safe Care, they are more likely to receive referrals for and enroll late registrant clients.

In **Site 2**, there are five nurses serving three major counties; of which one of the nurses is half-time NFP, half-time Healthy Start delivering an evidence-based program called Seeking Safety that is available to families affected by substance use and are not eligible for NFP, i.e., they have delivered. The local Healthy Start Coalition holds the contract for NFP and subcontracts to the health system that the nurse supervisor works for, along with three Departments of Health. Out of the five nurses, three serve one major county, where two are based out of the local health system with the nurse supervisor (one is CAPTA-funded, English-speaking who also implements Healthy Start, and the other is MIECHV-funded and bilingual Spanish-speaking) and the third is

out of the local health department. For the other two counties, the nurse is out of the health department and reports to the NFP nurse supervisor, as well as the health department's director of nursing. Each subcontracted site is responsible for hiring their own nurse and has a data entry person hired to enter data for NFP around 6 hours a week.

Site 3 consists of seven nurse home visitors, one nurse supervisor, and one program coordinator serving one county. Three nurses primarily serve the northern part of the county while the remaining four serve the southern part. The nurse supervisor and program coordinator are hired by the Network Partner that holds the contract. The Network Partner contracts with three FQHCs and one faith-based nonprofit agency to hire the nurse home visitors. There are two nurses in two FQHCs, one nurse in the third FQHC, and one nurse in the nonprofit. There are no other case management or mental health support within the NFP team, though they may be offered through the clinic they are affiliated with depending on client needs. The majority of the nurses are bilingual, with one nurse who identified as being NOT bilingual, one nurse who speaks English and Creole, and the remaining nurses who speak Spanish. The NFP program is primarily funded by MIECHV. The nurse supervisor explained she previously supervised eight nurses but lost funding in December 2021 for two positions. Luckily, one health center stepped in to fund the seventh nurse. This site does not receive CAPTA funding.

TABLE 3: QUALITATIVE INTERVIEW SITES' AGENCY AND FUNDING

Agency Implementation and Funding		
	Agency and Implementation	Funding Type
Site 1	Community-Based Non-Profit (Primary)/Team Sits Within Local Non-Profit Organization	Team 1 MIECHV and Team 2 CAPTA (4 Nurses)
Site 2	CBO (Primary)/Health Care Delivery > Health System/Hospital AND Government > Local Health Department (Partial hospital-based system. Team sits within multiple organizations/agencies.)	MIECHV And One CAPTA Funded Nurse
Site 3	Local Non-Profit	MIECHV, State Dollars, and funds from NSO Incentive Fund

STUDY FINDINGS

REFERRALS TO NFP

We examined referrals to NFP using data from the Coordinated Intake and Referral System, Florida Prenatal Risk Screen, and Birth Certificates to help us determine if allowing late referrals increased referrals of those most likely to benefit from NFP, i.e., people with overlapping adversities. This analysis is novel because it cannot be done using data collected by NFP and relies on data sources outside of routine NFP data collection. Characteristics that were more likely to be observed among late registrants included being more likely to be born outside of the US and more likely to have other children in the home under age 5. Qualitative findings illustrate local and systems challenges contributing to late referrals, in additional to client and program-level reasons for late referrals such as denial of pregnancy (for young clients) and clients being referred to NFP through word-of-mouth later in pregnancy. Both quantitative and qualitative findings revealed that not all referrals to NFP go through the Coordinated Intake and Referral System in Florida.

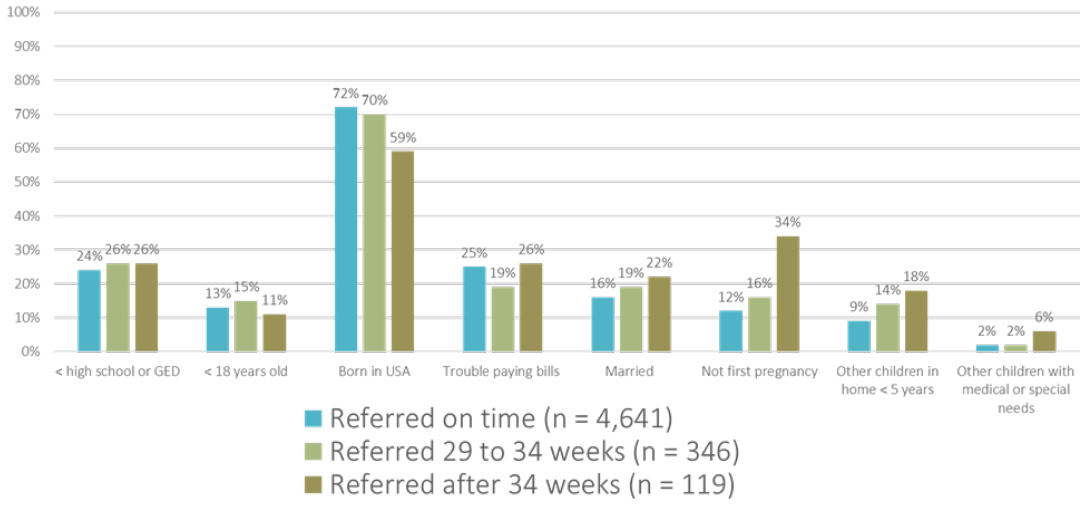
Quantitative Learnings

Based on current data, 5,106 pregnant individuals were referred to NFP from 1/1/2021 through 12/31/2022. We expect some referral data to be missing because we are still waiting for approval to receive additional Coordinated Intake and Referral data from 2022. **Among those referred, 90.8% (4,641/5,106) were referred by 28 weeks gestation, 6.8% (346/5,106) were referred between 29- and 34-weeks gestation, and 2.3% (119/5,106) were referred after 34 weeks gestation.** Most late referrals were made to the following NFP sites: Northeast Florida Nurse-Family Partnership Team, Nurse-Family Partnership Broward, Nurse-Family Partnership Space and Treasure Coast, and Nurse-Family Partnership Alliance Miami-Dade.

Demographic Characteristics

Pregnant individuals referred to NFP after 28 weeks gestation were statistically less likely to have been born in the United States, more likely to have been pregnant previously, and to have other children in the home under age 5 years compared to those referred to NFP before 28 weeks of pregnancy. Those referred after 28 weeks were not statistically more likely to be different for the other characteristics shown in Figure 4 indicating that any other differences seen in the graph may be due to chance alone. When we compared the subgroup of those referred to NFP after 34 weeks gestation to those referred on time (by 28 weeks), those referred after 34 weeks were more likely to have another child with medical or special needs in the home.

FIGURE 4: DEMOGRAPHIC CHARACTERISTICS BY TIMING OF REFERRAL

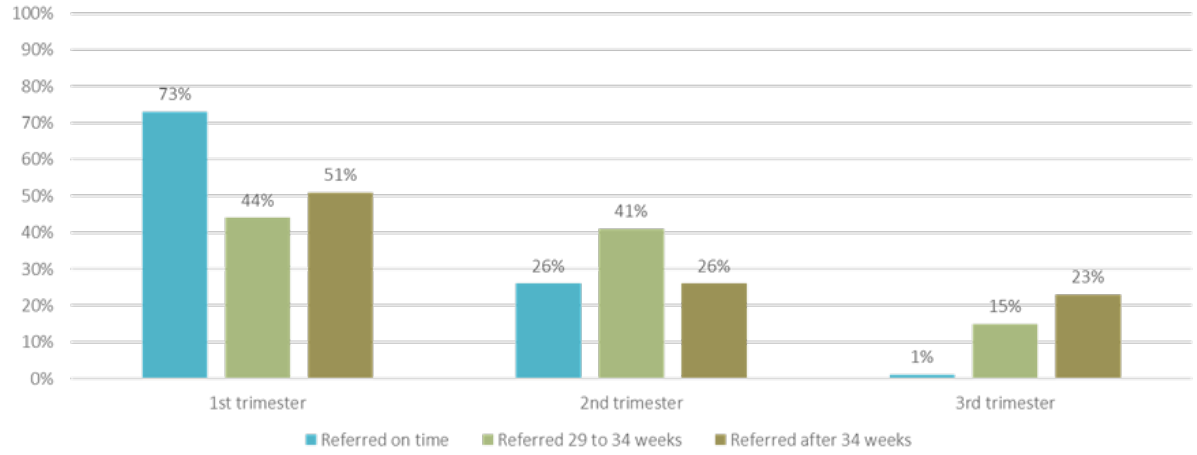


Pregnancy Characteristics by Timing of Referral

Pregnant individuals referred after 28 weeks were statistically less likely to have their first prenatal visit in the 1st trimester and more likely to have their prenatal visit in the 2nd or 3rd trimesters compared to those referred by 28 weeks (see Figure 5).

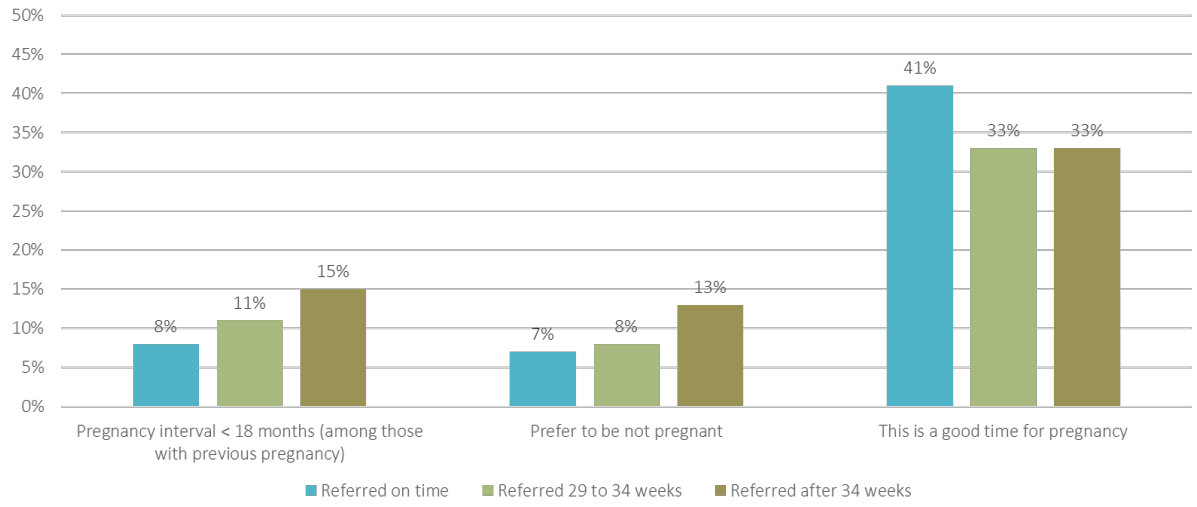
While these findings suggest that about half of those referred late were not identified in a timely manner due to late prenatal care, about 50% received prenatal care in the 1st trimester and could have been identified and referred sooner.

FIGURE 5: TIMING OF FIRST PRENATAL VISIT



Those referred to NFP after 28 weeks of pregnancy were not statistically different for pregnancy interval and pregnancy preferences compared to those referred by 28 weeks of pregnancy (see Figure 6). When we compared the subgroup of those referred after 34 weeks gestation to those referred by 28 weeks, those referred after 34 weeks were more likely to indicate that they would prefer to be not pregnant.

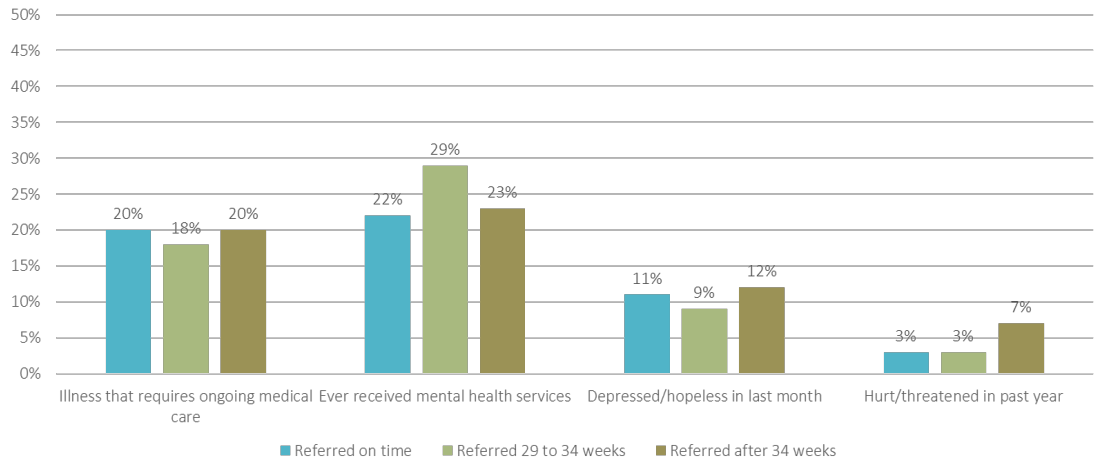
FIGURE 6: PREGNANCY INTERVAL AND PREGNANCY PREFERENCES



Maternal Health Indicators

We found that those referred after 28 weeks were not statistically different for physical and mental health indicators compared to those referred by 28 weeks indicating that the apparent differences seen in the graph may be due to chance alone (see Figure 7).

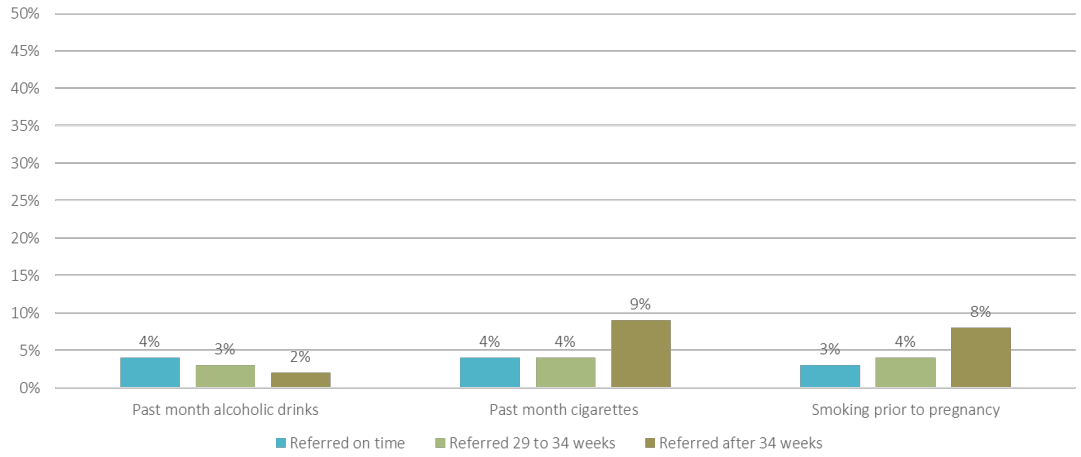
FIGURE 7: MATERNAL HEALTH INDICATORS



Maternal Substance Use

We found that **pregnant individuals referred to NFP after 28 weeks were statistically more likely to report smoking prior to pregnancy on the birth certificate compared to those referred to NFP by 28 weeks (see Figure 8).** Those referred after 28 weeks were not statistically different for report of past month alcohol or cigarettes on the prenatal risk screen compared to those referred by 28 weeks indicating that any differences seen in the graph may be due to chance alone.

FIGURE 8: MATERNAL SUBSTANCE USE



Qualitative Learnings

Community and Population

Participants characterized their client population as **ethnically and racially diverse**, with several nurses serving immigrant clients, those with undocumented status, and clients whose native language is not English. Site 1 listed primarily Latin American and Afro-Latinx populations for their immigrant clients, including Central American (Salvadorian, Ecuadorian, Guatemalan, and Nicaraguan), and Mexican, in addition to Botswanan. Similarly, staff from Site 2 also serve people from Latin American origin, including Central American and Mexican, in addition to Cuban, Brazilian, Haitian, and Afghan. Staff from Site 3 said they primarily serving clients from Spanish-speaking origin (countries not described). It was acknowledged that to adequately serve the client population, the **nursing team has to be diverse in their language abilities, with a particularly high need for Spanish-speaking nurses** due to the large number of clients that are from Latin American origin. All nursing teams accommodated the needs of their immigrant clients by having nurses on their teams that speak the languages spoken by their clients. Spanish was most often spoken by these clients and all nursing teams had at least one Spanish-speaking nurse with these nurses' carrying caseloads with most or all Spanish-speaking clients. Other languages spoken by nurses include Creole, Portuguese, Italian, and Greek. Bilingual nurses are equipped to serve immigrant populations because of their awareness of community-based resources for immigrant populations and navigating complicated systems, particularly for those who are undocumented and have not received timely prenatal care.

> "Our team is very representative of the community we serve because we have a lot of either Spanish-speaking clients, a lot of undocumented clients…"

Challenges exist for their immigrant clients due to fears regarding their immigration status, low-economic status, exploitation, and fearing to enroll in programs. Immigrant clients fear their undocumented status will be exposed to law enforcement, such as U.S. Immigration and Customs Enforcement (ICE), or other people of authority, through any type of government involvement and will lead to deportation. Along with being unaware that people with undocumented status can qualify for federal and/or local programs, fears also prevent them from signing up for programs, such as enrolling in NFP or Supplemental Nutrition Program for Women, Infants and Children (WIC), obtaining prenatal care, or even answering their door.

Affordable housing was a significant concern for all three sites, noting the limited availability of affordable housing options, particularly due to high demand and an influx of new residents from other states. Many nurses noted that their client populations experience a variety of housing challenges, including homelessness, unstable house, living with a large number of people, or live in unsafe home environments. Homelessness includes families that reside in shelters or who "couch surf". Housing instability includes challenges in finding and maintaining safe and stable housing and living in crowded conditions. Unsafe home environments included people in the same home using substances, verbally or physically assaulted clients, or were otherwise deemed a safety hazard for women and children. Table 4 summarizes community characteristics for each site.

TABLE 4: QUALITATIVE SITES' COMMUNITY ATTRIBUTES

Community Attributes
Site 1
• Primarily serves Latin American, Afro-Latin American, and immigrants from Central America, Mexico, and Botswana • High number of babies born annually (approximately. 17,500 annually) • NFP clients served primarily in east, west and south of the county • North county is high income • Due to substantial number of families needing services, community agencies collaborate to support families • Community challenges include lack of affordable housing, racial disparities, high infant mortality, immigration status
Site 2
• Primarily serves Latin American, Afro-Latin American, and Caribbean clients. Immigrants from Latin America, Haiti, and Afghanistan. • County serves both urban and rural communities • Densely populated resort town and winter destination • Mix of socioeconomic status, ranging from wealthy to below poverty level • Issues with transportation and traffic • Community challenges include lack of affordable housing, high black infant mortality, lack of access to internet for rural regions, immigration status

Site 3
• Serving diverse clients, including immigrants from Latin America • County serves both urban and rural communities • Populous urban region with severe traffic congestion • Community challenges include lack of affordable housing, navigating community programs and services, reliable forms of communication, immigration status

Reasons for Late Referrals

Based on qualitative findings, we learned that there are several reasons for NFP enrollment after 28 weeks gestation. These reasons fell into three main areas: client-level reasons, reasons attributed to NFP processes, and those related to systems, i.e., health care and Coordinated Intake and Referral (CI&R). Client-level reasons related to accessing care late, relocation, and refusing NFP initially. NFP processes related to wrong contact information, referral source, transfers, and waitlists. Systems-level reasons related to CI&R lag times, provider practices, and barriers to getting appointments on time.

Client-Level Reasons for Late Referrals

At the client-level, the most reported reason for late referral and enrollment by NFP staff across all three sites was due to **accessing initial prenatal care later in pregnancy**. When pregnant people receive prenatal care late, the Healthy Start screen is completed later in pregnancy and the CI&R outreach process is also late. By the time the referral reaches NFP, the client is most certainly past 28 weeks of pregnancy.

There were multiple reasons for accessing care late as shared by many NFP staff across all three sites. First, pregnant people may be in denial of their pregnancy; they may not realize they are pregnant, or they may refuse to believe that they are pregnant and thus do not access prenatal care. A portion of pregnant people may be waiting for Medicaid to begin accessing care. In cases of immigrant or undocumented people, they may wait to access emergency Medicaid later in pregnancy as this insurance only lasts for three months. Some pregnant people may just not know where to access care, while others do not believe or understand that prenatal care is needed, important or routine. Distrust of the healthcare system, transportation barriers, work schedule restrictions, and broader health system availability issues may also contribute to why pregnant people access care late.

Meanwhile, NFP staff from two sites discussed how immigrant or undocumented people may be hesitant to engage in any system, i.e., health care or NFP and therefore do not receive timely prenatal care. Some undocumented people may access care "on time" (i.e., earlier in pregnancy) but are fearful of systems involvement and decline NFP services when they are asked to sign the consent form and release of information. Other immigrant or undocumented people may arrive in the United States late in their pregnancy and need support; because they arrive late, they then also enroll in NFP late.

> "And then we have our undocumented population, which is large here. We have families from Central and South America who are afraid to get involved in any kind of system because they fear deportation… [nurse name redacted] has a lot of clients on her caseload that are immigrants, undocumented, and so then they don't qualify for resources either. We have to… do work arounds to get them service."

In one site, some NFP staff shared that other people of certain demographics tend to be referred late. Teenagers may access prenatal care late due to not knowing they are pregnant or denying that they are pregnant. Some Black and African American clients may also face similar experiences. Finally, some NFP staff from all three sites explained that clients may be enrolling late due to transfers/relocation, or initially refusing NFP and then requesting it late. In the case of transfers, clients are relocating and sometimes considered "late" when they are transferred from another NFP site. These clients enrolled prior to 28 weeks in their original NFP site, but the transfer to a new site labeled them sometimes as a "late registrant" to the new site. Other times, clients are relocating to a different area/community for support, and it takes time for them to "settle down" and access prenatal care. Some NFP staff also explained that pregnant people may not be reached because they are distrustful of unknown numbers. Others may refuse NFP initially (when they are early in pregnancy) because they do not want someone visiting them, feel they do not need support, or that they would not benefit from the program. Some of these people later request NFP and call back to enroll, because they are nervous or need support as they near delivery.

NFP Process Contributing to Late Referrals

NFP staff from two sites mentioned that **late referrals may come from outside of the CI&R system**, i.e., through word of mouth or other entities like WIC and behavioral health facilities. In one site, some NFP nurses explained that they receive many referrals through word of mouth, often among their immigrant and Latinx clients. These word-of-mouth referrals tend to come when the pregnant person is later in their pregnancy and needs support. In a different site, NFP receives referrals from other entities like WIC and behavioral health. One nurse explained that when referrals come from outside the obstetrics offices/CI&R, they tend to be for pregnant people later in their pregnancy, who have greater needs and would really benefit from NFP participation.

Systems Processes Contributing to Late Referrals

At the systems-level, some NFP staff from all sites described **CI&R lag times, provider practices, and barriers to getting appointments on time**. It is not unusual for there to be lag time between CI&R outreaching to a pregnant person and NFP receiving the referral. In one site, this issue was identified by the nurse supervisor and has since been resolved. Some NFP nurses from one site explained that there is no issue with the CI&R system in terms of timing. Health systems and private providers also pose challenges to enrolling clients on time, as they serve as the primary referral source conducting Healthy Start screens. For example, some providers may not conduct screens at the first obstetrics visit or identify risks later in pregnancy as the patient receives care. In one site, an NFP nurse explained how private providers may not take insurance and often have challenges conducting Healthy Start screens on time. In multiple sites, some NFP staff shared that providers may not educate patients about NFP at all, or if they do it is late in pregnancy. On the other hand, some providers offer too many resources to patients early on; they become overwhelmed and forget about NFP or need more time to consider enrolling. Oftentimes, these people end up enrolling late when they require more support. In one site, a health system recently bought out the obstetrics clinics in the community, leading to major staffing and process changes, including how prenatal care is offered. Pregnancy confirmation visits are now required prior to the first prenatal obstetrics visit. This buy-out has resulted in difficulty for patients to access appointments, leading to getting screened later, and subsequently outreached by CI&R and ultimately referred to NFP later. Some of these people seem to access care late; but appointments are being cancelled due to COVID-19 burnout or rescheduled.

> "Late entry into the healthcare system. Our area, they do a screening when they go to the OB, and that generates a referral quite often."

ENROLLMENT IN NFP

Quantitative Learnings

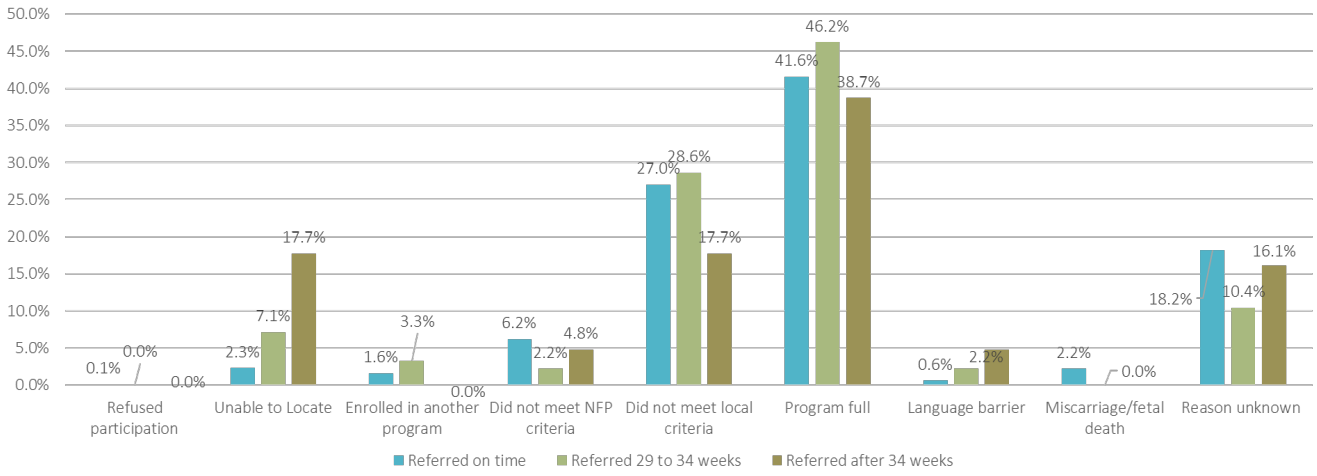
Enrollment Rates

Among those referred to NFP by 28 weeks gestation, 38.4% (1782/4641) enrolled in NFP. Among those referred to NFP after 28 weeks, 47.5% (221/465) enrolled in NFP. This difference is statistically significant indicating that pregnant people referred to NFP late are more likely than those referred on time to enroll in the program; however, this finding should be interpreted with caution as we are awaiting additional referral data from the Coordinated Intake and Referral System.

Reasons for Not Enrolling

Regardless of the timing of referral to NFP, outright refusal to participate was rare. In the cases where the reason for not enrolling was indicated as 'unable to locate' or where the reason is unknown, a pregnant individual may have been refusing 'passively' by not responding to the NFP team's effort to contact them (see Figure 9).

FIGURE 9: REASONS FOR LATE ENROLLMENT



Qualitative Learnings

Reasons for Late Enrollment

Aside from being referred late, other contributing factors to late enrollment to NFP include **transfers, relocation, and nurse caseloads.** NFP staff from all three sites explained that clients may be enrolling late due to transfers/relocation or initially refusing NFP and then requesting to enroll later. In the case of transfers, clients are relocating and sometimes considered "late" when they are transferred from another NFP site. These clients enrolled prior to 28 weeks in their original NFP site, but the transfer to a new site labeled them sometimes as a "late registrant" to the new site. Other times, clients are relocating to a different area/community for support, and it takes time for them to "settle down" and access prenatal care. Also mentioned were that pregnant people may not be reached because they are distrustful of unknown numbers. Others may refuse NFP initially (when they are early in pregnancy) because they do not want someone visiting them, feel they do not need support, or that they would not benefit from the program. Some of these people later request NFP and call back to enroll, because they are nervous or need support as they near delivery.

> "It's a scenario that they, they're being offered the program, but they say no when they were like, let's say, 25 weeks. But then when they come to 37 or 35, they start saying, 'Oh my gosh, you know, I want the program.' Something like that."

> "So, and that's why we said we wanted to be part of the late registrants because sometimes by the time we got to the mom, she was over 28 weeks because she had to wait so long in the wailing list."

Additionally, NFP staff from a couple sites spoke about full caseloads (leading to a waitlist) that may also lead to late enrollment. Some NFP nurses from one site explained that they have a long waitlist for potential clients. By the time their caseload opens, these people are later in their pregnancy and enroll late.

Late Enrollment Among Multiparous Mothers

A few NFP nurses from different sites shared about late enrollment among their multiparous clients. The reasons described were not different to those for primiparous clients. Major reasons for late enrollment related to accessing care late; this may be due to lack of transportation and housing instability/moving counties, difficulty getting prenatal appointments, or lack of concerns about their pregnancy (e.g., no bleeding and can feel fetal movement). Like primips, multips may not being screened for eligibility for NFP when they are not accessing prenatal care. Multips may also be considered "late" when re-enrolling with subsequent pregnancies. For example, one client was participating in NFP, became pregnant again and due to domestic violence, was re-enrolled into the program "late" with her second child.

> "And we have seen an uptick in patients who get no prenatal care because it is hard to get the appointment. So, when they realize they cannot get the appointment, a lot of them are like, 'I've done this already, this is my third kid. Like I'm fine, I could feel the baby moving, all is well, I'm not bleeding.' And so, then they utilized the ER for any problems that arise, and they just don't get care."

GROUP DIFFERENCES
AMONG THOSE ENROLLED IN NFP

LATE REGISTRANT CHARACTERISTICS

We used data from NFP program implementation to examine differences between clients enrolled in NFP 'on time' (by 28 weeks of pregnancy) and late registrants (clients enrolled after 28 weeks of pregnancy) for demographic and health characteristics; program delivery including screenings, referrals, visit duration, number of visits, and program retention; and program outcomes. **The purpose of this analysis was to help us understand how nurses may need to tailor NFP specifically for late registrants and identify additional support that NFP nurses might need when serving late registrants.**

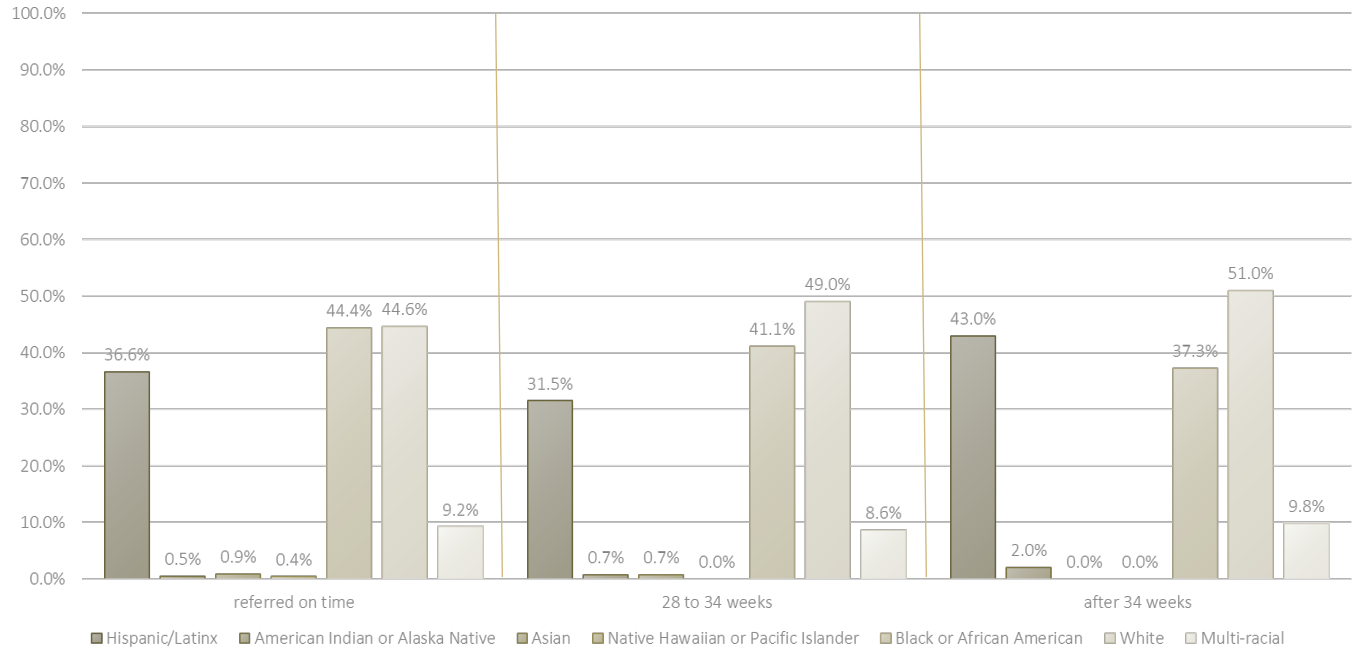
Quantitative Learnings

We observed some differences in characteristics between clients enrolled in NFP who were referred before 28 weeks and those who were referred after 28 weeks of pregnancy. **Specifically, clients who were referred after 28 weeks of pregnancy were more likely to: 1) speak Spanish, 2) be older, and 3) less likely to report having used marijuana.** We found no statistical differences regarding race/ethnicity, education levels, or other health indicators as measured by the Health Habits Form.

Race and Ethnicity

Figure 10 shows the percentage of clients in each demographic group categorized by 1) referred 'on time' or before 28 weeks of pregnancy, 2) between 28 and 34 weeks of pregnancy, and 3) after 34 weeks of pregnancy. The race and ethnicity of those enrolled in NFP are not statistically different based on whether they were referred to the program by 28 weeks or after 28 weeks of pregnancy.

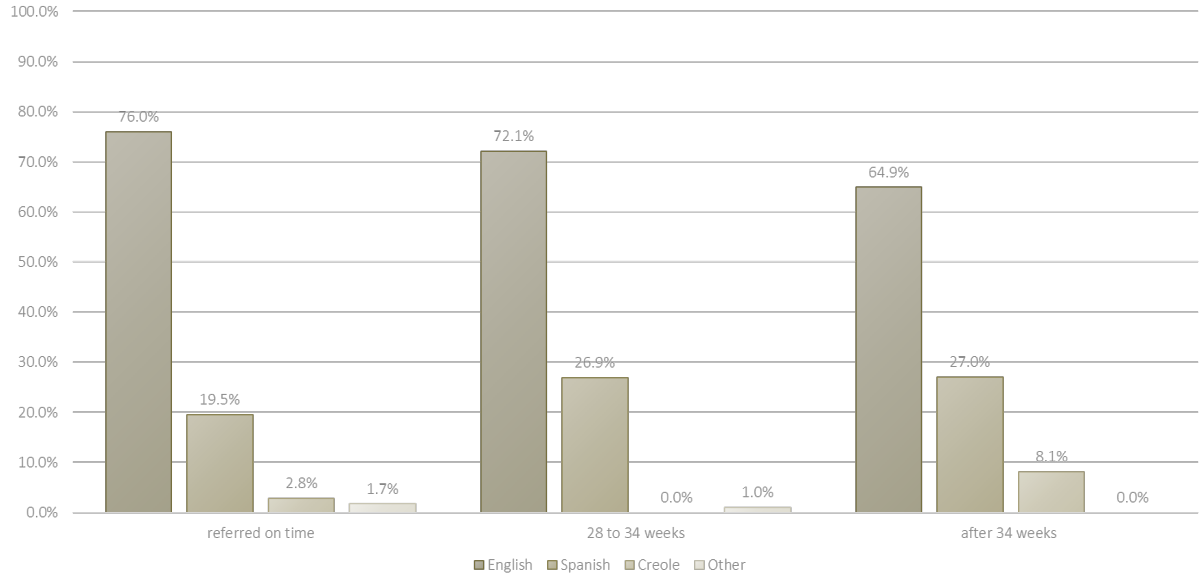
FIGURE 10: RACE AND ETHNICITY OF THOSE ENROLLED IN NFP BY TIMING OF REFERRAL



Language Spoken

Figure 11 shows the clients' primary language spoken categorized by 1) referred 'on time' or before 28 weeks of pregnancy, 2) between 28 and 34 weeks of pregnancy, and 3) after 34 weeks of pregnancy. The primary languages observed by the population were 1) English, 2) Spanish, 3) Creole, and 4) other language. Those referred after 28 weeks of pregnancy were **statistically more likely to speak Spanish** compared to those referred on or before 28 weeks.

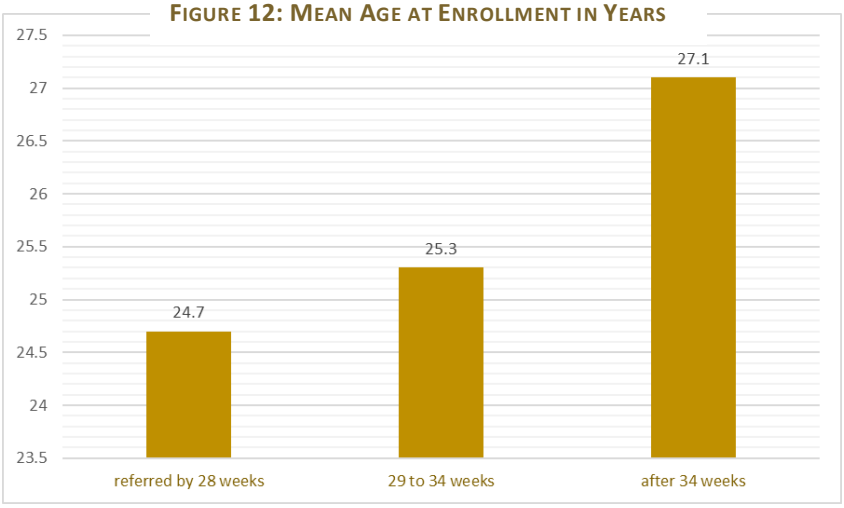
FIGURE 11: PRIMARY LANGUAGE SPOKEN



Maternal Age

The mean age at enrollment in NFP for those referred by 28 weeks was 24.7 years, from 28 to 34 weeks was 25.3 years, and after 34 weeks was 27.1 years (Figure 12). The difference in age between those referred on time compared to those referred late was statistically significant.

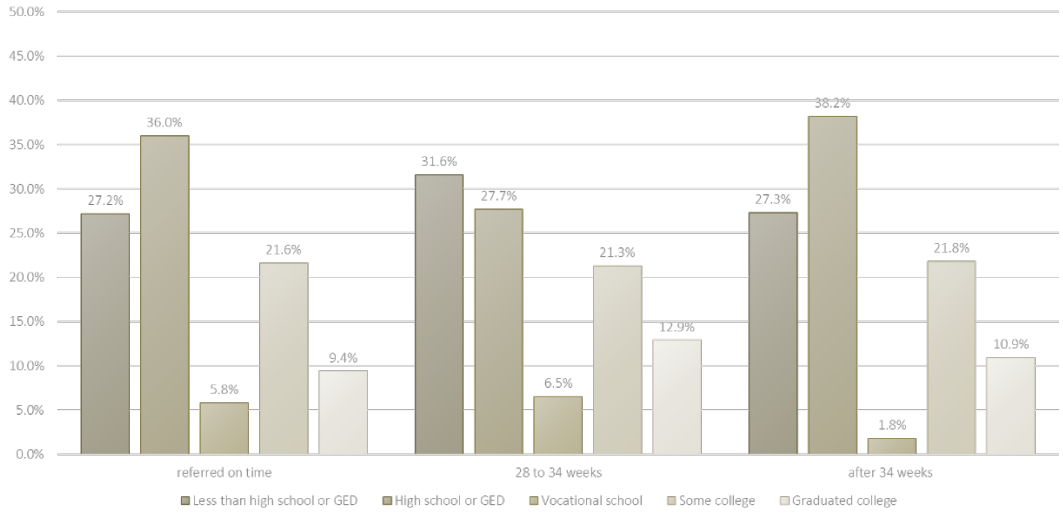
FIGURE 12: MEAN AGE AT ENROLLMENT IN YEARS



Education Level

Figure 13 shows clients' level of education for 1) referred 'on time' or before 28 weeks of pregnancy, 2) between 28 and 34 weeks of pregnancy, and 3) after 34 weeks of pregnancy. Levels of education include 1) less than a high school diploma or General Education Diploma (GED), 2) High school diploma or GED, 3) Vocational school, 4) Some college, and 5) Graduated college. The level of education for those enrolled in NFP was not statistically different for those referred after 28 weeks compared to those referred by 28 weeks of pregnancy.

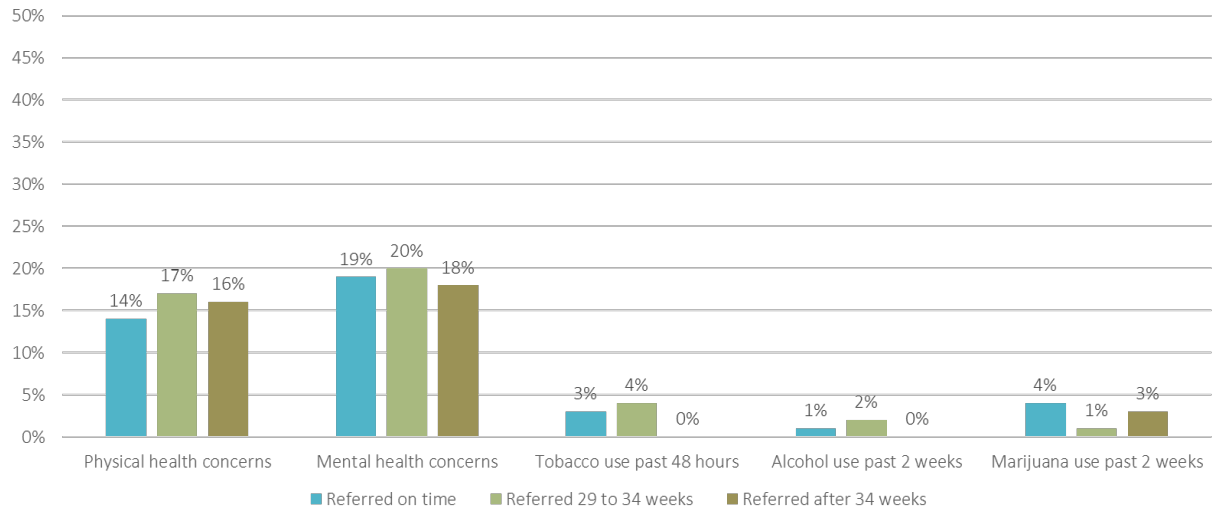
FIGURE 13: EDUCATION LEVEL



Health Indicators

Using data obtained from the 'Health Habits' form, we examined 1) physical health concerns, 2) maternal health concerns, 3) tobacco use in the past 48 hours, 4) alcohol use in the past 2 weeks, and 5) marijuana use in the past 2 weeks for clients referred 'on time' or before 28 weeks of pregnancy, between 28 and 34 weeks of pregnancy, and after 34 weeks of pregnancy (see Figure 14). Among pregnant individuals enrolled in NFP, **those referred after 28 weeks were statistically less likely to report having used marijuana in the past 2 weeks around the time of NFP intake**. **However, data regarding substance use at intake were often missing, so this finding may not be reliable.** Those enrolled in NFP did not differ for other health indicators.

FIGURE 14: HEALTH INDICATORS OF THOSE ENROLLED IN NFP BY TIMING OF REFERRAL



Qualitative Learnings

During qualitative interviews, NFP nurse home visitors, supervisors, and community partners were asked to characterize the late registrant population, including those that are referred and enrolled into NFP. In general, those who registered after 28 weeks mirrored those who enroll before 28 weeks of pregnancy. However, **some characteristics such as immigration status, history of substance use, young age, and history of interpersonal violence** offer insights into why clients may be referred later into pregnancy. Clients who access prenatal care later into pregnancy tend to also be referred later to NFP, such as undocumented individuals who are afraid to obtain care. Late registrants who experience adversities, such as **instability in housing, food**

insecurity, and speaking languages other than English, benefit from the support provided by an NFP nurse home visitor, such as connecting them to resources and local programs before they deliver their baby.

Food and Housing Insecurity

Food and housing insecurity are experienced by the NFP client population, including those that enroll in NFP after 28 weeks. These were among the biggest challenges families are facing among nurses' caseloads; most nurses discussed their focus to help clients enroll to receive benefits, the process of enrolling, and sending and receiving referrals to and from the programs, such as WIC and Supplemental Nutrition Assistance Program (SNAP) benefits (also called food stamps) and identifying possible housing options. Among nurses' top priorities when serving clients that enroll late into NFP is to get them enrolled into appropriate services. Nurses emphasize the importance of ensuring the client's immediate needs are being met, including ensuring the clients have enough to eat, are enrolled in Medicaid, and have stable housing. One nurse, in particular, noted that she could "figure out the fluffy stuff later", meaning the emotional/therapeutic elements of the program could be delayed until she secures the client's necessities.

Prenatal and Developmental Screenings

When discussing developmental delays or cognitive disabilities in clients enrolled after 28 weeks, nurses discussed challenges in the receipt of appropriate and timely prenatal screenings and developmental testing for infants. Concerns were raised about timeliness of prenatal screenings for congenital risks, such as Down's Syndrome. Nurses counseled late registrant clients about the importance of appropriate screening while also not scaring them about negative fetal outcomes. Much like the way nurses serve clients who enroll before 28 weeks, nurses also perform appropriate developmental screenings and reinforce ways to promote healthy development with families who enroll after 28 weeks. Nurses described performing screenings and questionnaires with children and families to identify developmental or emotional delays in the same way they would with clients enrolled before 28 weeks of pregnancy.

Immigration Status and Language

When describing their late registrant population, many nurses and supervisors noted clients being from other countries, particularly from Mexico, Central and South America, and the Caribbean, with many having undocumented status. Challenges for their immigrant clients include fears due to their undocumented status, low-economic status, exploitation, and fearing to enroll in programs. Specifically, immigrant clients are fearful of their undocumented status being exposed to law enforcement, such as ICE, or other people of authority, through any type of government involvement. They believe that the exposure of their status would lead to deportation. Along with being unaware that people with undocumented status can qualify for federal and/or local programs, fears also prevent them from signing up for programs, such as enrolling in NFP or WIC, obtaining prenatal care, or even answering their door. The importance of having bilingual nurses on the team was illustrated by one supervisor who discussed how these nurses can bridge the gap to resources for non-English speaking clients. Bilingual nurses are equipped to serve this population because of their awareness of community-based resources for immigrant populations, particularly for those who are undocumented and have not received timely prenatal care.

> "So, we don't really get to talk too much about the future and trying to help them become self-sufficient. You know, I feel the late registrants we're like, "Alright, we gotta get you on the WIC, we gotta get you on food stamps, we gotta get you on Medicaid, we gotta get you all the free stuff that we possibly can, so that you can just live."

Mental Health and Substance Use Disorder

Maternal mental health and substance use concerns are characteristics of some people enrolling in NFP past 28 weeks of pregnancy as described by NFP nurses and supervisors. Mental health challenges include anxiety, depression, and/or postpartum depression, and/or substance use disorders (SUD). Many of the clients who enrolled after 28 weeks of pregnancy were described as having both SUD and mental health challenges, particularly anxiety and depression, along with other co-occurring adversities and personal challenges, such as low income, homelessness, experience of interpersonal violence, physical health concerns, and young age. One reason for late registration among this population described by one nurse is that clients with SUD may relapse, and thus delay their enrollment in NFP. Nurses observed multiple challenges when serving clients impacted by mental health challenges and/or SUD including having fewer visits during the prenatal period and having less time to

> "You have women with chronic hypertension, lots of histories of mental health issues, lots of histories of intimate partner violence."

address mental health concerns with their nurse/provider prior to giving birth, being able to provide education in a timely manner, or nurses having less time to obtain their client's trust before they give birth. Furthermore, nurses shared about challenges in capturing mental health concerns using available screeners due to cultural factors, not having the trust of their clients due to prior negative experiences with providers, or that they may not be fully honest with their health/symptoms for other reasons.

Physical Health and Pregnancy

Many nurses and supervisors discussed the physical health and pregnancy-related health concerns observed among their late registrant clients including health issues during pregnancy, after delivery, and chronic conditions, referrals for late registrants experiencing health concerns, and challenges with enrolling late registrants with health concerns. Some late registrant clients had a history of pregnancy complications, including a history of miscarriage, history of preterm labor, and pre-eclampsia or hypertension. Also described were other factors or conditions among their late registrants that could negatively impact pregnancy outcomes, such as having a low or high body mass index (BMI). A few nurses described specific instances where their late registrant clients experienced a possible pulmonary embolism and infection. One client was reluctant to go to the hospital after symptoms of a pulmonary embolism were identified by her NFP nurse who then encouraged her to seek care, while another client was advised by her NFP nurse that she was showing signs of an infection, despite her provider telling her she did not. Chronic health conditions were also observed by nurses in their late registrant clients, including a history of chronic hypertension, diabetes, or human immunodeficiency virus (HIV).

> "But if I ever got a referral and like I said, she's 31 weeks, but she's got this, this, this, and this risk. I would always take that step to say, you know, 'She needs to have NFP services, she needs a nurse because she has chronic hypertension and she's morbidly obese and she's already on diabetic medication, etcetera, etcetera.' So umm, I would... I was always given authorization to go ahead and enroll those clients, previously."

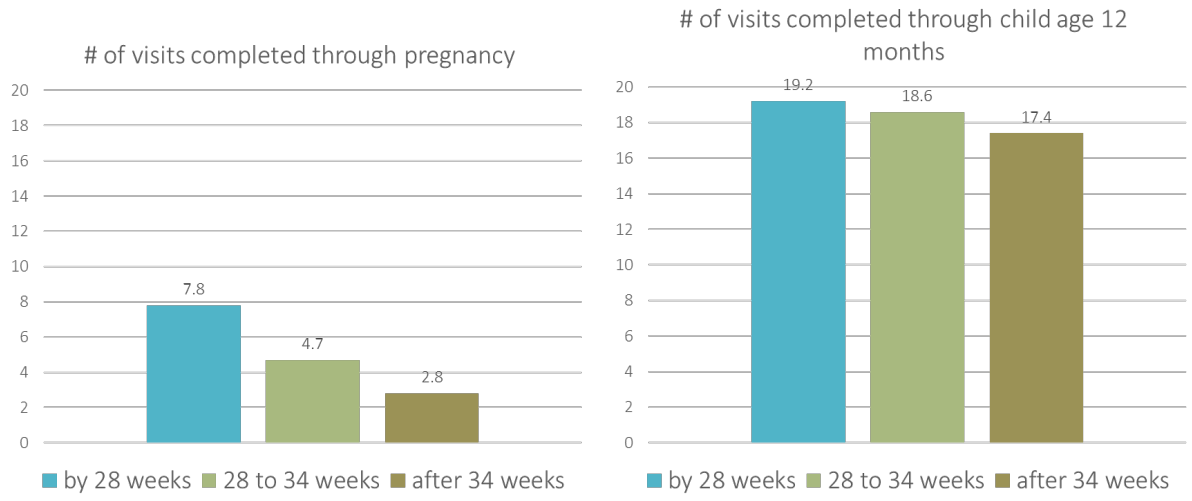
NFP PROGRAM DELIVERY

Using data from NFP, we observed differences in program delivery outcomes between those who were referred before and after 28 of pregnancy. **Differences were found in the number of visits, retention in NFP, referral to services including referrals for substance use and child Medicaid, and screening for depression and IPV.** No differences were found in the duration of visits, screening for anxiety or child development (ASQ).

Number of Visits

The number of visits through pregnancy and number of visits through the child's first birthday were assessed to determine differences between those were referred before and after 28 weeks of pregnancy (see Figure 15). Among individuals enrolled in NFP, those referred after 28 weeks had **statistically significant fewer visits during pregnancy** than those referred by 28 weeks gestation. However, **by child aged 12 months, nurse home-visitors had made up the difference** so that a significant difference in the number of visits between those referred late compared to those referred on time was no longer present. **[**Note that we are not reporting data regarding number of visits and retention through child aged 24 months because few late registrants have completed the program through child aged 24 months.]

FIGURE 15: NUMBER OF VISITS COMPLETED



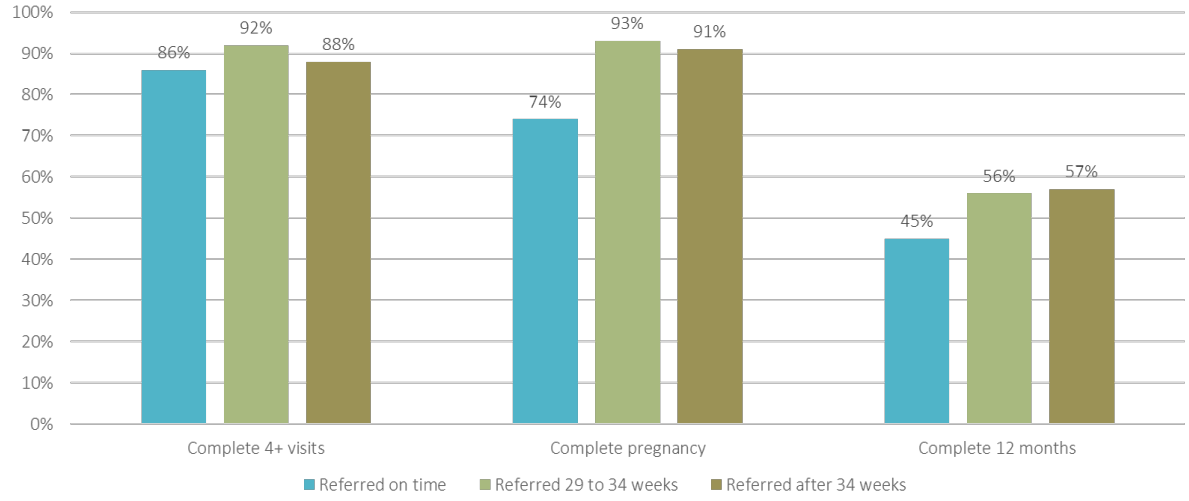
Visit Duration

The average visit duration ranged from 53 minutes during the infancy phase to 58 minutes during the toddler phase. Visit duration did not differ for any phase (pregnancy, infancy, or toddler) between those referred to NFP late and those referred to NFP on time.

Program Retention

Compared to those who were referred to NFP before 28 weeks of pregnancy, those who were referred to NFP after 28 weeks of pregnancy were **statistically more likely to be retained in the program** through pregnancy and through child aged 12 months (see Figure 16).

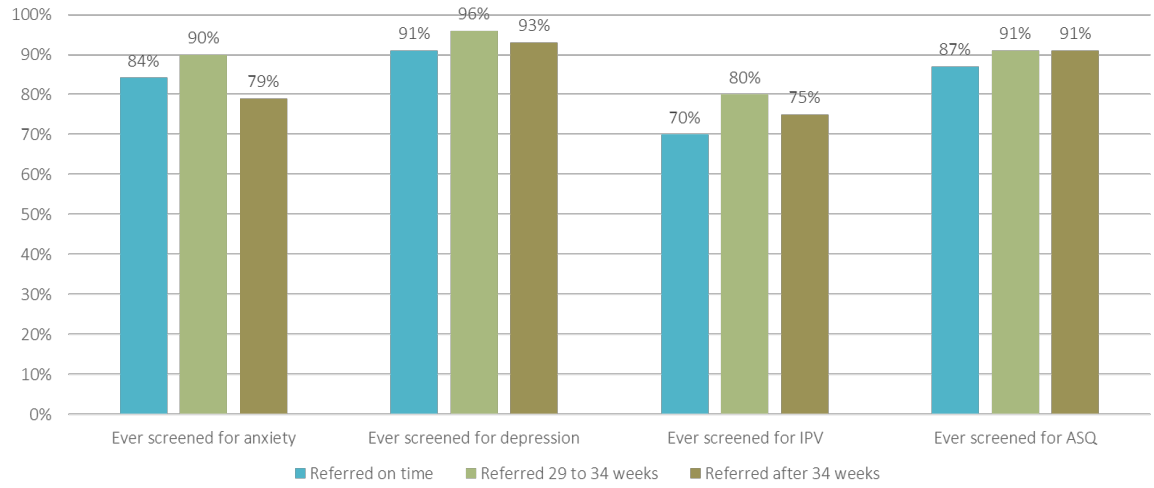
FIGURE 16: PROGRAM RETENTION



Screenings Completed

We assessed screenings completed by NFP nurses among clients referred to NFP before and after 28 weeks of pregnancy. Screeners included 1) anxiety, 2) depression, 3) intimate partner violence (IPV), and 4) child development via Ages and Stages questionnaire (ASQ). **Among those enrolled in NFP, those referred to NFP after 28 weeks of pregnancy were statistically more likely to be screened for depression and IPV (see Figure 17).** There was not a statistically significant difference in screening for anxiety or child development (ASQ).

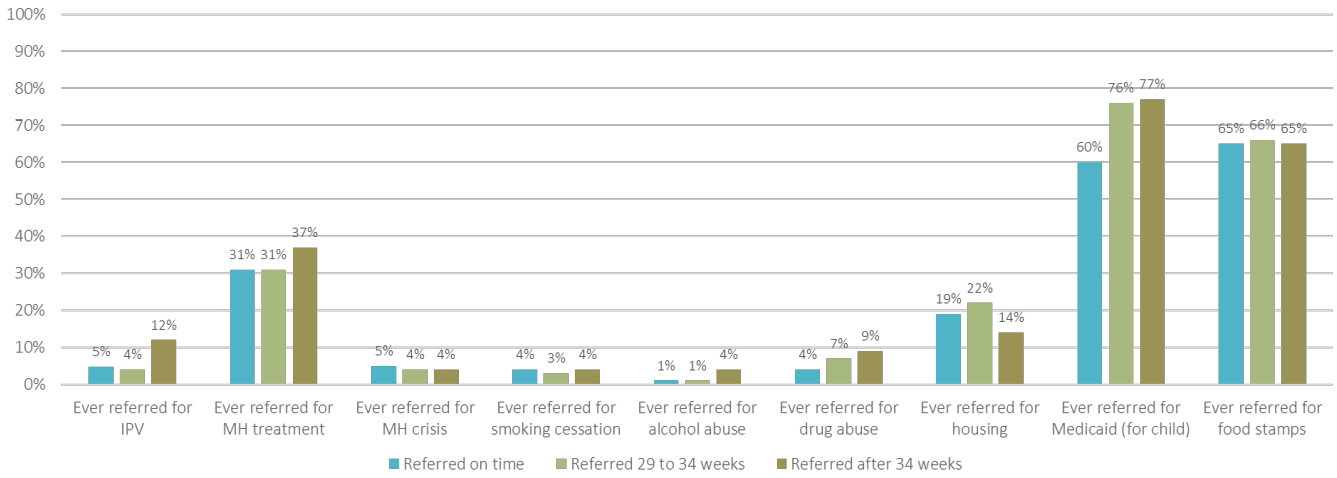
FIGURE 17: COMPLETED SCREENINGS



Referrals Made for Families by NFP Nurses

We assessed referrals to services made by NFP nurses to determine if any differences exist for clients referred to NFP before and after 28 weeks of pregnancy (see Figure 18). Services included 1) interpersonal violence (IPV), 2) mental health treatment, 3) mental health crisis, 4) smoking cessation, 5) alcohol use, 6) substance use, 7) housing, 8) Medicaid for child, and 9) food stamps. **NFP nurses were statistically more likely to make referrals for NFP clients who were referred to NFP late compared to clients who referred to NFP on time for drug abuse and for Medicaid for the child.** There was not a statistically significant difference in referrals for other services. In the subgroup of NFP clients referred after 34 weeks gestation, nurses were statistically more likely to make referrals for IPV compared to NFP clients who had been referred on time.

FIGURE 18: REFERRALS TO SERVICES



Qualitative Results

Program Delivery

Nurses reported adjusting program delivery, such as **modifying the educational content covered to meet the needs of the client, and the frequency of visits during the final weeks before delivery** as ways to keep clients engaged in the program. This included meeting more frequently, having longer visits, and utilizing phone calls and text messaging between visits. Several nurses discussed moving quickly through the various education topics and trying to cover a lot of material during the short window before delivery. This was done to ensure that clients received sufficient education preparing them for labor, birth, and the arrival of their baby. Many nurses from all sites also spoke about picking specific content and/or tailoring the education to meet the immediate needs of the client and focusing on preparation for labor and delivery.

Frequency and communication methods used for connecting with clients were also modified for clients who enrolled later than 28 weeks. Frequency included meeting or communicating daily, or more frequently than is done with clients enrolled in NFP prior to 28 weeks.

> "When I get them at that late stage, I see them every day. I see them, I talk to them every day. I talk to them through text basically, 'cause we can't visit every [day], but I do text every day. "How are you doing, how are you feeling, how are you doing, how are you feeling," every day, um, and I'm able to keep it. If I don't do that, I lose them. I lose them as a client."

Challenges in engagement were also discussed, including building trust with clients, having less time to establish a therapeutic relationship with the client, and limited knowledge about the client's personal lives because of the short time they are enrolled in the program before giving birth.

Prioritization of Education and Resources

Late registrant clients were reported as being anxious about the delivery and craving information about what will happen during labor and delivery. Some nurses recalled that the client's desire to learn this topic and the nurses' prioritization of this education encouraged client engagement with the program. Nurses described clients as generally having numerous questions about the delivery process, what to expect, and how to best prepare. Nurses from one site indicated that the visits and education involved prioritizing immediate health concerns and addressing immediate needs when visiting late enrollees experiencing health challenges. She stated that with the limited time they have with clients before they deliver, nurses must prioritize education to manage their health conditions, such as high blood pressure, preparing them for labor and delivery, and enrolling them in resources instead of focusing on other education, such as education on breastfeeding, safe sleep, or nutritional needs.

> "So, with late registrants, I definitely dive headfirst into, "Do you know what to... " Like, "Do you know what to expect or how to tell when you're going into labor?" You know, even though that's a big topic that everybody wants to talk about what to expect, but if you get a 15-weeker… you can more so go over…nutritional things, making sure you're get to your appointments, but… if you get a late registrant and you wanna go headfirst into… what to expect, how do you know when you're in labor, and do you have the necessities that you need to go home with the baby? You know…'cause time is ticking and you're in that window."

Client Retention

Interviews revealed reasons for dismissal from the program including clients no longer being interested in or benefiting from program offerings and/or education, not having enough time for program participation particularly after the arrival of their baby, moving out of the service area, and nurses not being able to get a hold of their client via phone or texts. Nurses talked about things that they feel contribute to clients' decision to leave the program, including nurses having limited time to build a relationship with their clients, clients not seeing the value in the program, and overwhelming clients with too much information. **Nurses that these reasons did not differ from on-time registrants.**

> "When I get them at that late stage, I see them every day. I see them, I talk to them every day, I talk to them through text basically, 'cause we can't visit every [day] but I do text every day. "How are you doing, how are you feeling, how are you doing, how are you feeling," every day and I'm able to keep [them]. If I don't do that, I lose them."

As previously mentioned, not having enough time to develop a bond with their clients was another reason that nurses attributed to lack of engagement and/or clients leaving the program. Because clients enroll later into their pregnancy, nurses felt that they did not have enough time to build a relationship with their clients before their babies arrive. To address this, nurses modified program delivery by consistent communication such as texting or calling them daily and frequent visits promoted their engagement and continued participation. This helped with establishing a trusting relationship where clients viewed their nurse as a dependable source of support and reliable source of information.

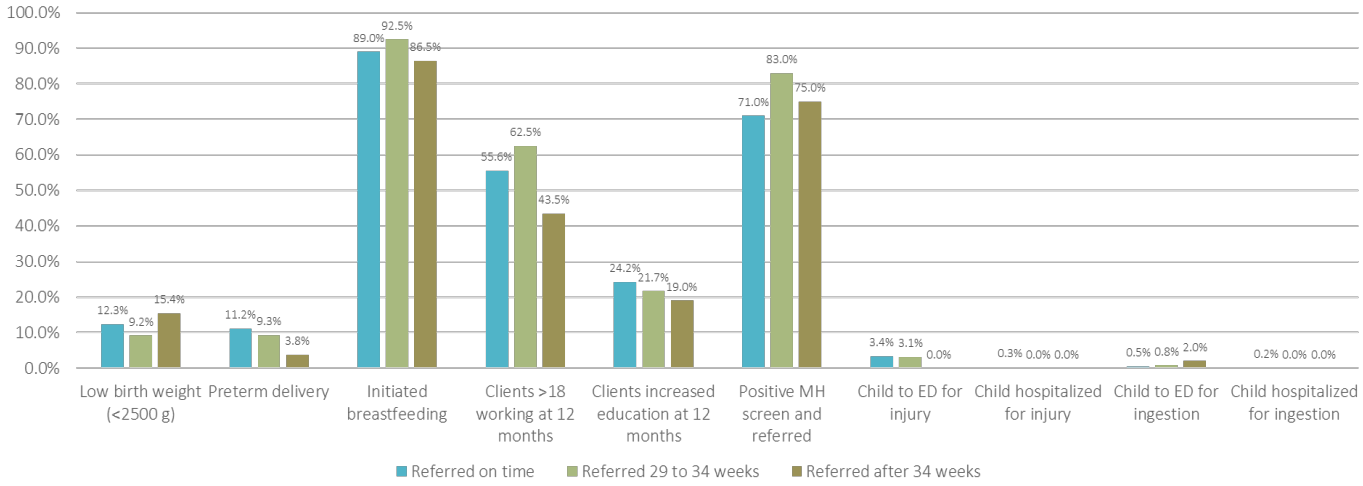
Nurses offered strategies to retain their late registrant clients including ensuring that clients are equipped with information to prepare them for birth and bringing their baby home, while balancing the amount of information so as to not overwhelm them. Connecting them to resources, social services, and addressing immediate needs such as support for interpersonal violence and substance use also fostered continued engagement.

NFP PROGRAM OUTCOMES

Maternal and child health outcomes were assessed to determine differences between NFP clients who had been referred before and after 28 weeks of pregnancy. Outcomes included 1) low birth weight (less than 2500 grams), 2) preterm delivery (before 37 weeks of pregnancy), 3) initiated breastfeeding, 4) clients greater than age 18 working at 12 months postpartum, 5) clients increased education at 12 months postpartum, 6) positive mental health screen and referred to mental health services, 7) child admitted to Emergency Department (ED) for injury or ingestion through age 2, and 8) child hospitalized for injury or ingestion through age 2 (see Figure 19).

Program outcomes for NFP clients were not statistically different when compared between those referred by 28 weeks (on time) and those referred after 28 weeks (late registrants). As more late registrants are enrolled in NFP, further analyses may be indicated to explore possible differences within the late registrant group between those referred between 29 and 34 weeks and those referred after 34 weeks.

FIGURE 19: NFP PROGRAM OUTCOMES



SUMMARY OF FINDINGS

First, we examined referrals to NFP (including pregnant people who ultimately did not enroll in NFP and those who did enroll in NFP) and found that compared to those who were referred to NFP before 28 weeks gestation (on time) those who were referred to NFP after 28 weeks gestation (late) were older, more likely to have delayed their first prenatal visit, more likely to be multiparous, more likely to be an immigrant, and more likely to report using tobacco. Nurses described their observations that delays in receipt of prenatal care and referral to NFP could be due to system-level factors such as difficulty in getting a prenatal appointment, factors related to structural oppression such as fear of accessing care or denial of care due to immigration or undocumented status, and individual-level factors such as denial that they were pregnant or lack of immediate pregnancy concerns. Next, we examined enrollment in NFP and found that those referred late appear to be more likely to enroll in NFP; however, this finding is tentative as we are receiving additional data needed to confirm. Nurses described that, in addition to receiving the referral late, delayed enrollment in NFP could be due to relocation from one NFP site to another and wait lists. Finally, we examined NFP program delivery and program outcomes. We found that nurses modified program delivery for late registrants including number of visits and type and timing of topics addressed. Modifications to program delivery for late registrants did not affect completion of screenings (mental health, IPV, and child development), length of visits, or total number of visits by child aged 12 months. Late registrants were more likely to be retained in NFP. Based on the data we have so far, NFP program outcomes were not different for late registrants compared to NFP clients referred and enrolled on time. Figure 20 summarizes these findings and indicates whether they were based on quantitative (numeric) data, qualitative (interview) data, or both.

FIGURE 20: SUMMARY OF FINDINGS

Overlapping Findings	Quantitative Findings	Qualitative Findings
• More likely to delay first prenatal visit • More likely to be multiparous • Less likely to be born in the US and large portion of immigrant clients from Latin America and Caribbean • Mostly Spanish-speaking • Tobacco use more common • No difference in mental health indicators • Nurses modified program delivery for late registrants, including more or fewer visits or modified educational content depending on the needs of the client	• More likely to include children with medical or special needs • More likely to be older in age • No difference in pregnancy preference • More likely to enroll in NFP • More likely to be retained in NFP • No differences in NFP program outcomes	• Delays in care due to immigration or undocumented status, referrals systems process, provider or health system practices, personal challenges, beliefs, or barriers • Delayed referral to and/or enrollment in NFP due to relocation, wait lists, lack of immediate pregnancy concerns

BENEFITS OF ALLOWING LATE REGISTRANTS

A primary benefit of expansion of NFP is the ability to reach and enroll more people who are likely to benefit from the NFP program. NFP nurses acknowledged this benefit, noting that their late registrant clients would not have gained its benefits and acknowledged existing barriers to enrolling for these families. Advisory Board members discussed how service providers, such as prenatal care providers or even NFP, may 'blame' potential participants for not accessing services, but often the lack of access indicates a need for the system or service provider to change. NFP's flexibility in allowing late registrants demonstrates an understanding of barriers to accessing services that include systemic barriers and structural oppression. NFP nurses and Advisory Board members also discussed the potential benefits of allowing NFP enrollment after the birth of the baby. A key aspect of that discussion was that the benefits of NFP for late registrants depend on the outcomes that the client and program are trying to achieve. For example, we expect that NFP would not impact birth outcomes for people who enroll a short time prior to giving birth or after giving birth, but NFP may still affect later outcomes such as maternal mental health, caregiver-child interactions, and child development in this population.

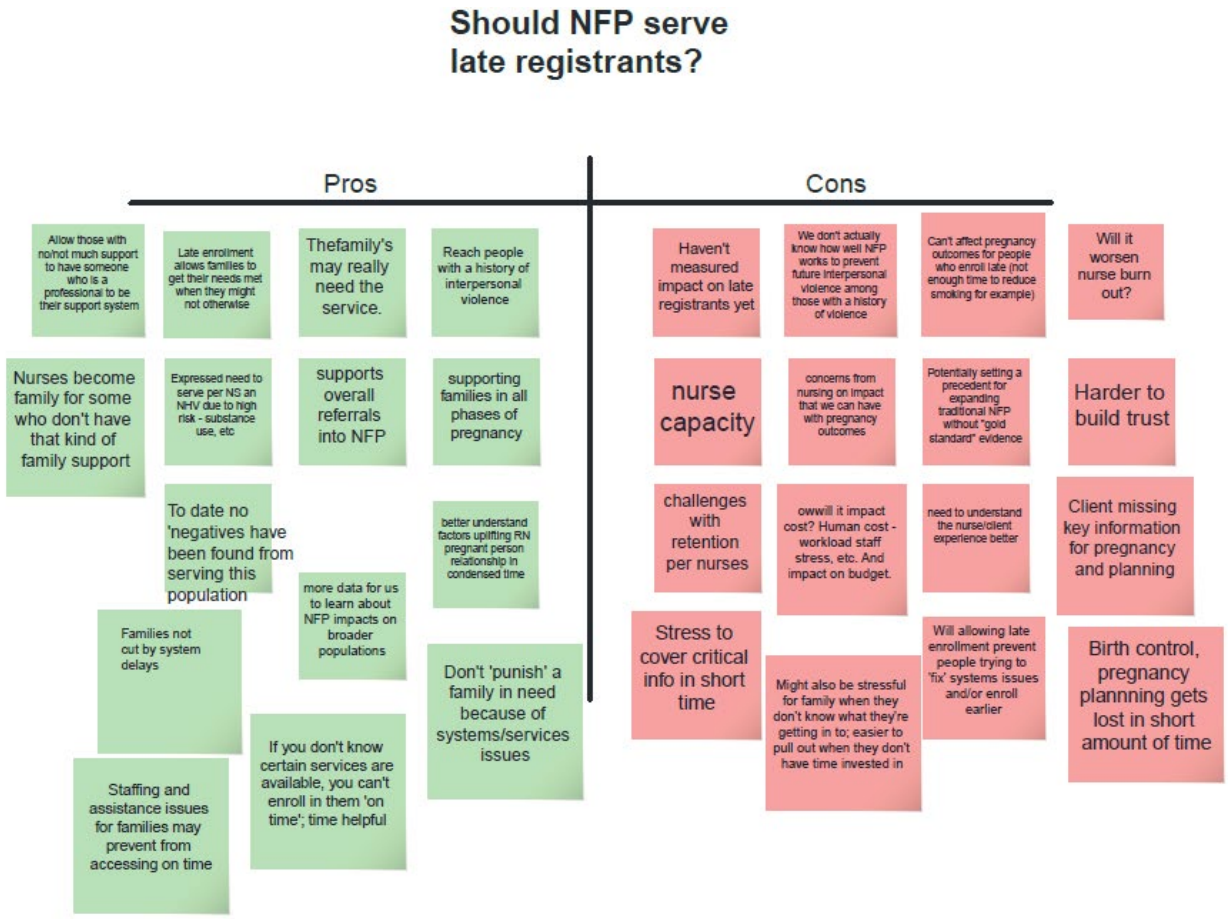
> "Let's put it that way… Better late than never because sometimes mom can be going through certain things and then you come late. You came right at the moment where they needed you the most. Because especially… sometimes a lot of time it's mental issues. And it's not really that they need a therapist or anything else but having you to talk with trying to sort things out."

RISKS OF ALLOWING LATE REGISTRANTS

> "I think every client that gets the program, that's a success. You know, there's a lot of value in that. So, if the choice is to not have the client as a client or having her late, then obviously it would be better to have her late than not at all."

Advisory Board members also discussed the potential risks of allowing late registrants in NFP. These included the risks of increased nurse burn out and its effect on nurse retention. Our interviews with some NFP teams and observations made by one of the Advisory Board members who conducts site visits with home-visiting agencies in Florida suggested that, without appropriate preparation and support, NFP nurses could become overwhelmed by serving late registrants largely because of the feeling that they need to 'pack everything in' in a very short time before the birth of the baby. The Advisory Board identified the current lack of data regarding the impact of NFP for late registrants and the likelihood that NFP won't impact birth outcomes for late registrants as additional risks. Figure 21 is an artifact from one of our Advisory Board meetings in which members identified the pros and cons of allowing NFP to serve late registrants that illustrates our discussion of risks and benefits.

FIGURE 21: ARTIFACT FROM ADVISORY BOARD ACTIVITY TO IDENTIFY RISKS AND BENEFITS OF SERVING LATE REGISTRANTS



NEXT STEPS

Through this work, our team has collected a wealth of information that could be used for the expansion of NFP to serve multiparous clients and clients enrolled past 28 weeks of pregnancy. We have also learned about processes, including outcome prioritization, establishing, and engaging community partners through an Advisory Board and obtaining data from multiple state agencies. We plan to share these learnings with NFP partners and scientific and research communities. Furthermore, we would like to continue our work in Florida by conducting an **Impact Study** and will be seeking additional federal or foundation funding to do so. Two additional grant proposals that have been submitted to NIH stemmed from our work in Florida. Drs. James Kaferly and Greg Tung, both affiliated with the PRC, have submitted a proposal to investigate the role of NFP in **family preservation and reunification** for child welfare-involved families in Florida and Colorado. Dr. Caitlin Driesbach and colleagues at the University of Rochester School of Nursing have partnered with the PRC to submit a proposal to determine the **prevalence of non-severe and severe maternal morbidity and to test the effectiveness of NFP on maternal morbidity** by comparing individuals enrolled in NFP with individuals not enrolled in NFP in Florida. Finally, our work in Florida has prompted questions about the types and effectiveness of **Coordinated Intake and Referral Systems** for connecting pregnant people and young families with the services from which they are most likely to benefit.

DISSEMINATION

The PRC team will continue to disseminate findings from the Florida Bridge Pilot, including 1) professional and academic peer-reviewed articles, 2) presentations to professional and academic audiences, and 3) reports, infographics, and guides to NSO, partner sites, and community audiences.

Completed Products, Peer-Reviewed Publications, & Presentations

- Completed an NFP Expansion and Evaluation Guide available to NFP network partners interested in expanding NFP at their agency. The ***NFP Expansion and Evaluation Guide*** can be found on our website or by emailing Mandy at mandy.allison@cuanschutz.edu.
- Members of our team presented at the 2022 National Maternal Health Innovation Symposium, Chicago, IL (virtual). Venice Ng Williams and advisory board members Jennifer Marshall and Denise Brown presented on **Community Engagement and Outcomes Prioritization to Improve Family Health in Evidence-based Nurse Home Visiting in Florida**.
- With the support of members from our advisory board, lead author Venice Ng Williams and senior author Mandy Allison have published one paper in Maternal and Child Health Journal entitled ***Engaging Community in Prioritizing Outcomes to Improve Family Health in Evidence-Based Nurse Home Visiting: Using a Modified e-Delphi Method*** in November 2023.
- Venice Ng Williams and advisory board member Mirine Richey presented at AcademyHealth's Child Health Services Research Interest Group's Community of Practice on **Engaging Community in Child Health Services Research** in February 2024.

Future Dissemination Efforts

- Present learnings at the National Maternal Health Innovation Symposium, Health Start Coalitions Annual Meeting (FL), National Home Visiting Summit, Home Visiting Applied Research Collaborative (HARC) National Meeting, and/or other national and local conferences.
- Present learnings to NSO partners (e.g. All Staff meeting and/or Lunch & Learn). We are scheduled to present our outcomes prioritization process with Research & Evaluation in March 2024.
- Report findings through one-pagers or infographics to local community partners and participating NFPx sites.
- Advisory Board Guide
- Data Use Agreement (DUA) Guide